REMARKS

Amendments to the Claims

Claim 1 is amended to recite that the polypeptide comprises amino acid sequence SEQ ID NO:6042, an amino acid sequence have greater than 80% sequence identity to SEQ ID NO:6042, or at least 10 consecutive amino acids of SEQ ID NO:6042. Support is at page 97, line 26 to page 98, line 3. New claims 133 and 134 are also supported at page 97, line 26 to page 98, line 3. Claim 114 is amended to depend from new claim 133.

Claims 22, 23, 25-28, 114, 115, and 117 are amended to recite an immunogenic composition. Support is at page 29, lines 9-10. Claim 115 is amended to correct the name of the bacterial species from *Bordella* to *Bordetella*. Claim 22 is amended to correct antecedent basis. Claims 2, 3, 121, 122, and 126 are amended to correct various formatting errors for "SEQ ID NOs:." Clarifying amendments are made to claims 2, 8, 27, 28, 115, 131, and 132.

Rejection of Claims 1-8, 22, 23, 27, 28, and 94 Under 35 U.S.C. § 102(a)

Claims 1-8, 22, 23, 27, 28, and 94 stand rejected under 35 U.S.C. § 102(a) as anticipated by Genbank Sequence AY274119. The Patent Office contends this sequence was submitted on April 13, 2003, with a draft publicly available as of April 12, 2003. Office Action at page 7.

Genbank AY274119 is not prior art to Applicants' priority date of April 13, 2003. First, SEQ ID NO:147, which is identical to the Spike protein of SEQ ID NO:6042, is

disclosed at page 39 in Serial No. 60/462,748,[1] to which this application claims priority.[2] Serial No. 60/462,748 was filed on April 13, 2003, which means that SEQ ID NO:6042 has a priority date of April 13, 2003.

Second, Exhibit 2 establishes that AY274119 was not publicly available until April 14, 2003 at 10:49 AM, after Applicant's April 13, 2003 priority date. Exhibit 3 establishes that the AY274119 sequence disclosed on April 14, 2003 contains only the SARS genome sequence and lacks any description of particular SARS proteins. Genbank AY274119 is not prior art to claims 1-8, 22, 23, 27, 28, and 94, and therefore does not anticipate these claims. Please withdraw the rejection.

Rejection of Claims 2 and 23 Under 35 U.S.C. § 102(e)

Claims 2 and 23 stand rejected under 35 U.S.C. § 102(e) as anticipated by Plummer (US 20070258999). Applicants respectfully traverse the rejection.

Plummer does not anticipate claims 2 and 23 because it does not lead a skilled artisan to envisage SEQ ID NO:7307. The disclosure of a genus in the prior art is not necessarily a disclosure of every species that is a member of that genus. Rather, for a genus to anticipate a species, one of ordinary skill in the art must be able to "at once envisage" the specific species within the genus. M.P.E.P. § 2131.02 (8th Ed. Rev. August 2007). Plummer teaches SEQ ID NO:6042 but does not provide any additional information to direct the skilled artisan to envisage SEQ ID NO:7307. Plummer therefore does not anticipate claims 2 and 23.

[1] A copy of page 39 is enclosed for the Examiner's convenience as Exhibit 1.

[2] In the response filed July 13, 2009, Applicants stated the earliest priority was April 14, 2003; however, further analysis identified a priority date of April 13, 2003. Applicants apologize for any inconvenience.

Please withdraw the rejection.

Rejection of Claims 25, 26, 95-98, 114, 117, and 127-132 Under 35 U.S.C. § 103(a)

Claims 25, 26, 95-98, 114, 117, and 127-132 stand rejected as obvious over Genbank AY274119, in view of Ksiazek,[3] Cavanagh,[4] Song,[5] and Gasparini.[6]

Applicants respectfully traverse the rejection.

As noted above, Genbank AY274119 is not prior art to the claimed invention. None of Ksiazek, Cavanagh, Song, or Gasparini teaches a SARS Spike protein. The Patent Office has not made a *prima facie* case of obviousness.[7]

Please withdraw the rejection.

Rejection of Claims 22, 23, 25-28, 114, 115, and 117 Under 35 U.S.C. § 112 ¶ 1

Claims 22, 23, 25-28, 114, 115, and 117 stand rejected under 35 U.S.C. § 112 ¶ 1 as lacking enablement.

The Patent Office contends that the claims are not enabled because SARS virus vaccine technology is unpredictable. The Patent Office states that the "instantly claimed

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[3] Ksiazek *et al.*, "A novel coronavirus associated with severe acute respiratory syndrome," N Engl J Med. 2003 May 15;348(20):1953-66.

[4] Cavanagh *et al.*, "Coronavirus IBV: virus retaining spike glycopolypeptide S2 but not S1 is unable to induce virus-neutralizing or haemagglutination-inhibiting antibody, or induce chicken tracheal protection," J Gen Virol. 1986 Jul;67 (Pt 7):1435-42.

[5] Song *et al.*, "Induction of protective immunity in chickens vaccinated with infectious bronchitis virus S1 glycoprotein expressed by a recombinant baculovirus," J Gen Virol. 1998 Apr;79 (Pt 4):719-23.

[6] Gasparini *et al.*, "Increased immunogenicity of the MF59-adjuvanted influenza vaccine compared to a conventional subunit vaccine in elderly subjects," Eur J Epidemiol. 2001;17(2):135-40.

[7] It is not clear to Applicants whether the Patent Office has rejected claims 1, 22, and 94 as obvious in paragraphs 29-37. However, Applicants' argument that claims 25, 26, 95-98, 114, 117, and 127-132 are non-obvious applies with equal force to any rejection of claims 1, 22, and 94 that relies on AY274119. Applicants request that any such rejection applied to claims 1, 22, and 94 be withdrawn.

invention is highly unpredictable because a vaccine for a new virus is not routinely achievable." Office Action at page 5.

Claims 22, 23, 25-28, 114, 115, and 117 are amended to recite an immunogenic composition. Applicants respectfully traverse the rejection as applied to the amended claims.

The enablement requirement of 35 U.S.C. § 112 ¶ 1 states that a patent specification must teach a person skilled in the relevant art how to make and use the invention claimed. The legal test for whether a disclosure provides adequate enablement for a generic claim is that "the scope of the claims must bear a *reasonable correlation* to the scope of enablement provided by the specification to persons of ordinary skill in the art." *In re Fisher*, 427 F.2d 833, 839, 166 U.S.P.Q. 18, 24 (C.C.P.A. 1970) (emphasis added), *cited with approval in Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 1212, 18 U.S.P.Q.2d 1016, 1026 (Fed. Cir. 1991).

Claims 22, 23, 25-28, 114, 115, and 117 recite immunogenic compositions. The specification provides enablement to persons of ordinary skill in the art with respect to making and using the recited compositions to induce an immune response.

The specification supplies substantial amounts of data demonstrating that full-length Spike and truncated Spike proteins are immunogenic. Figure 69 demonstrates binding of human monoclonal antibody S3.2 to purified truncated Spike protein. Figure 70 shows ELISA titers of antibodies induced by the SARS Spike protein. The left column shows the response to inactivated virus, the middle and right hand columns show immune responses truncated Spike protein. Figure 73 is a western blot demonstrating antibody binding to both full-length and truncated Spike. The left hand panel shows full-

length Spike, the right panel showns truncated Spike. Induction of potent immune responess by Spike antigens delivered by alphavirus was also obtained in mice (Fig. 68). Based on these data, it is clear that Spike proteins and protein fragments are particularly good immunogens.

Moreover, because other strains' Spike proteins are highly similar, the specification provides substantial guidance to make and use Spike proteins from other strains to stimulate immune responses. Table 12 on page 397 shows that out of a total of 1255 amino acids in the Spike sequences, there are only two differences between FRA and TOR2, one between Urbani and TOR2, three between CUHK and TOR2, and one between HKU and TOR2. Because these Spike proteins are so similar across different strains, there is no reason to believe that the recited composition would not stimulate an immune response.

Yang[8] further supports enablement. Yang injected polynucletotides expressing full-length Spike and two mutant Spike proteins from the Urbani SARS strain, which is only one amino acid different from the Tor2 Spike protein, into mice. The mutated proteins had deletions in the cytoplasmic domain (SΔTM) or the transmembrane and cytoplasmic regions (SΔCD). See Yang, page 561, col. 2. Expression of all three proteins gave robust immune responses: "Injection of S [full-length Spike], SΔTM and SΔCD expression vectors induced a substantial immune response," Yang, page 561, col. 2, ¶ 3, further establishing that Spike proteins make good immunogens.

Finally, the Patent Office agrees that it would be reasonable to expect success in making and using Spike protein fragments to induce immune responses:

[8] Yang et al., "A DNA vaccine induces SARS coronavirus neutralization and protective immunity in mice," Nature. 2004 Apr 1;428(6982):561-4, enclosed with accompanying Information Disclosure Statement.

> One skilled in the art would have a reasonable expectation of success in making and using the claimed S1 fragments of SARS for inducing an immune response, given that the sequence of [the] S gene was available at the time the application was filed, and also given the success of the prior art that the S1 fragment is sufficient to induce [an] immune response as shown by both Cavanagh and Song.

Office Action at page 13.[9]

Based on the teachings in the specification and in the art, the weight of the evidence clearly establishes that amended claims 22, 23, 25-28, 114, 115, and 117 are enabled for their full scope. Please withdraw the rejection.

Respectfully submitted,

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[9] Of course, as noted above, there is no record of evidence that any SARS Spike sequence was identified by others before Applicants' priority date.